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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,036	01/15/2002	Toshihiko Tanaka	XA-9613	2902
181	7590	04/26/2005	EXAMINER	
MILES & STOCKBRIDGE PC 1751 PINNACLE DRIVE SUITE 500 MCLEAN, VA 22102-3833			PHAN, THIEM D	
			ART UNIT	PAPER NUMBER
			3729	

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,036

Applicant(s)

TANAKA ET AL.

Examiner

Tim Phan

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) 21 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 18-20 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. The amendment filed on 2/28/05 has been fully considered and made of record.

Election/Restrictions

2. Newly submitted claims 21 and 22 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the limitation “a resist material containing light absorber” belongs to Claim 12 of Group II, which is restricted and nonelected on 7/30/03.

Since applicants have received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 21 & 22 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 6, 18, 19, 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama et al (US 6,007,969) in view of Lin et al (US 5,718,991) or vice versa.

As applied to claim 1, Hatakeyama et al teach, as prior art, a method of photolithography and photomasking a circuit pattern which reads on applicants' claimed limitations, including a step of projecting light (Fig. 15B, 4) through exposure treatment of a photomask (Fig. 15B, 3), which has a shade pattern (Fig. 15B, 3a) on a plate and transmitting the pattern to a photoresist (Fig. 15B, 2).

Lin et al teach a method of making photomasks by applying to a transparent substrate such as glass, black pigment particles (Col. 4, lines 43-50), well known to have size between 10 to 100 nanometers, in order to have a submicron range pattern.

It would be obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings by applying the nanosize black pigment particles, taught by Lin et al, to the photomasking of Hatakeyama et al in order to have a submicron range pattern.

As applied to claim 6, Lin et al teach the carbon black pigment particles (Col. 4, lines 43-50), well known to have size between 10 to 100 nanometers.

As applied to claim 18, Lin et al teach the shade pattern on a glass substrate (Fig. 5a, 11 & 10).

As applied to claims 19 & 20, Hatakeyama et al and Lin et al teach that the carbon pigment particles, well known to have size between 10 to 100 nanometers, scatter light of the exposure treatment (Fig. 15B, 4).

As applied to claim 23, Hatakeyama et al teach that the shade pattern is in the order of micron or more (Col. 2, line 14).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama et al in view of Lin et al and further view of May et al (US 4,465,749).

Hatakeyama et al and Lin et al teach a method of microfabricating a circuit which reads on applicants' claimed limitations, including nanosize black pigment particles (Lin et al, Fig. 5a, 11) used for pattern shielding on a plate (Fig. 5a, 10).

May et al teach that the toner to be employed as a mask (Col. 2, line 16) is made of carbon-black-pigmented (Col. 6, lines 4-6) at 20% (Col. 12, line 66).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the three teachings and to apply the toner-mask made of carbon pigment (as taught by May et al) at higher ratio and nano size in order to enhance the masking accuracy.

6. Claims 3, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama et al in view of Lin et al and further view of Takahiro et al (JP 05-289307).

As applied to claim 3, Hatakeyama et al and Lin et al teach a method of microfabricating a circuit which reads on applicants' claimed limitations.

Takahiro et al teach, as old art, the highly precise production of wiring (Cf. Fig. 5 a-d, element 51) by photosensitive film (Cf. Fig. 5, element 12) and etching.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the three teachings and to apply the making of conductive tracks (as taught by Takahiro et al) with a negative photosensitive film, which is also old in the art, in order to get the wiring corresponding to shade pattern or a photosensitive film to get a reverse through the light exposure mask.

As applied to claim 4, Hatakeyama et al and Lin et al teach the claimed invention except for having an area of shade pattern relatively smaller than an area of a light transmission region with no shade pattern.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create an area of shade pattern relatively smaller than an area of a light transmission region with no shade pattern since it was known in the art that the photomask can be patterned from regular size track to nano size one.

As applied to claim 5, Hatakeyama et al teach the etching through the photosensitive film (Cf. Fig. 15D, element 2) to form a via in the bottom layer (Cf. Fig. 15D, element 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to fill the via with conductive material to make connection between layers of circuit board.

7. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama et al in view of Lin et al teach and further view of Kunimichi et al (JP09-321184).

Hatakeyama et al and Lin et al teach a method of microfabricating a circuit which reads on applicants' claimed limitations.

Kunimichi et al teach the mounting of electronic components (Cf. Fig. 1, element 20 or Fig. 5) on one side of the microcircuit board as an interposer (Cf. Fig. 1, element 10) and the main printed circuit board (Cf. Fig. 1, element 30) on the other side.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the three teachings and to apply the mounting structure (as taught by Kunimichi et al) in order to create an interposer that matches/ connects the ultrafine and dense circuit of the chips to the normal size circuit of the PCB.

Response to Arguments

Applicant's arguments with respect to claims 1-8 and 18-23 have been considered but are moot in view of the new grounds of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 571-272-4568. The examiner can normally be reached on M - F, 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tim Phan
Examiner
Art Unit 3729

tp
April 22, 2005



A. DEXTER TUGBANG
PRIMARY EXAMINER